Linkages between Total Quality Management and Organizational Survival in Manufacturing Companies in Ghana

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Abstract

Purpose *- This study examined the linkages between total quality management and organizational survival in manufacturing companies in Ghana.*

Design/methodology/approach *– The quantitative approach and the survey method of collecting data were used. The questionnaire was administered through the face-to-face method of collecting data. A sample of 250 manufacturing firms within the metropolis of Kumasi, the second largest city in Ghana was selected and intervi ewed. The missing data and data anomalies were eliminated resulting in a final valid sample of 101. A structural equation model (SEM) was proposed to examine the relationships between the seven organizational linkages and five practices of TQM impact on the Ghanaian companies.*

Findings – *The findings showed significant positive effect of the seven Total Quality Management (TQM) elements on organizational performance.*

Originality/value – *This study demonstrated that Ghanaian and foreign owned manufacturing companies believe that total quality management is a key-contributing factor to a firm's survival.*

Keywords: TQM, organizational performance, manufacturing companies, Ghana, SEM

Introduction

Ghana is the world's second largest cocoa producer behind Ivory Coast, and Africa's biggest gold miner after South Africa. It is one of the continent's fastest growing economies, and newest oil producer. Its mineral exports accounts for 30% of gross foreign exchange earnings (Akabzaa & Darimani, 2001). Ghana is one of the more stable nations in the region, with a good record of political power changing hands peacefully. To drive the manufacturing and other sectors into accelerated growth and global competitiveness, Ghanaian businesses must look beyond their present conditions and employ every available alternative in terms of innovation, strategy and the best available technology. Most competitive organizations around the world have implemented Total Quality Management (TQM) practices and strategies to continuously upgrade performance. Total Quality Management (TQM) is a system of managing quality in organizations in order to improve products and services. Crosby (1979) stated "Quality management is a systematic way of guaranteeing that organized activities happen the way they are planned.

He continued, it is a management discipline concerned with preventing problems from occurring, by creating the attitudes and controls that make prevention possible" (p. 22). Top executives and managers are under increasing pressure to justify the value and contribution of TQM program expenditures to the performance of the organization. In Ghana, there is the challenge for the implementation of quality management practices in business organizations. The question that managers usually ask is will the implementation of these practices ameliorate business performance?

Objectives and Importance

The objective of this paper is to examine the linkages between TQM and organizational performance in manufacturing companies in Ghana. It is also to show how some Ghanaian and foreign companies operating in Ghana have embraced the concept of quality.

Research Questions

To what extent each of the organizational factors top management commitment, training for TQM, customer driven information, process control and improvement, employee empowerment, supplier involvement, and communications affect the practices of TQM impact on organization performance for productivity, market share, sales growth, profit growth, and quality of product/service.

Hypothesis

There is a significant effect of the organizational factors top management commitment, training for TQM, customer driven information, process control and improvement, employee empowerment, supplier involvement, and communications on the practices of TQM impact on organization performance for productivity, market share, sales growth, profit growth, and quality of product/service.

Literature Review

This study examines the linkages between total quality management and organizational survival in manufacturing companies in Ghana. Total Quality Management (TQM) is a management system that takes into consideration all the areas of the operations in an organization. Several researches have been conducted mostly in the developed world to determine the relationship between quality management practices and performance. In the developing world, the study of quality management practices and organizational performance is scanty. Few studies have been done in developing countries including some done by (Salahedin & Mukhalati, 2009; Yusuf, Gunasekaran, & Dan, 2007; Fening, Pesakovic, & Amaria, 2008; Fening, 2012).

Bergman and Klefjö (2007) stated that Total Quality Management (TQM) means a constant endeavor to fulfill, and preferably exceed the customer needs and expectations at the lowest cost, by continuous improvement work, to which all involved are committed, focusing on the process in the organization. Also, Kumar, Choisne, Grosbois, and Kumar (2009) defined TQM as the holistic management approach that integrates all the organizational activities to satisfy customers' needs and meet their expectations towards achieving overall organizational objectives.

Several studies have looked at the relationship between TQM and organizational performance and have concluded that there is a positive relationship between the two (Fening et al., 2008; Jun, Cai, & Shin, 2006; Prajogo & Sohal, 2006; Sila, 2007). Lin, Chow, Madu, Kuei, and Yu (2005) and Sila (2007) also argued that the implementation of TQM practices will enhance organizational performance. The past decades have also witnessed numerous studies in this field establishing a positive correlation between the implementation of TQM and organizational performance (Bergman & Klefjö, 2007; Kaynak, 2003; Sila, 2007).

TQM and Performance of Manufacturing Organizations

TQM can be implemented in all industries including service and manufacturing. As a result of this, TQM has gained popularity, attention and acceptance by academics and practitioners. This current study will focus on manufacturing companies in Ghana. As indicated, previous studies have looked at the relationship between TQM and organizational performance. Some have looked at TQM and small business enterprises. The studies done by Fening et. al. (2008) and Fening (2012) looked at quality management and small firm performance in Ghana. Prajogo (2005) has stated 'TQM has been credited with providing benefits for organizations that implement it properly' (p. 217). Some studies have concluded a positive relationship (Huarng & Chen, 2002; Sila & Ebrahimpour, 2002; Kuruppuarachchi & Perera, 2010; Kaynak, 2003; Yang, 2006).

Most quality practitioners have come out with a number of TQM elements. Flynn, Schroeder, and Sakakibara (1994) for example, have divided the elements into quality information systems, process management, product design, work force management, supplier involvement and customer involvement. Mann and Kehoe (1995) also have supplier improvement, process control and improvement of internal customer focus, measurement and reporting leadership, quality system, participation, recognition, education and training, external customer focus as the elements. Saraph, Benson, and Schroeder (1989) proposed eight elements of quality management, which are the role of management leadership and quality policy, the role of the quality department, training, product/service design, suppler quality management, process management, quality data and reporting, employee relations. After a comprehensive review of the existing TQM literature mentioned above, the following seven domains discussed below have been identified as the most primary TQM elements to be considered for this study. Some of these have been considered in other studies. For example, top management commitment to quality (Arawati, 2005; Zakuan, Yusof, Laosirihongthong, & Shaharoun, 2010; Hemsworth, Sanchez-Rodriguez, & Bidgood, 2005; Rohani, Yusof, & Mohamad, 2006; Suradi, Wan, & Mohamed, 2007; Yusuf et al., 2007), total quality training (Arawati, 2005; Zakuan et al., 2010; Rohani et al., 2006; Yusuf et al., 2007), customer driven information (Zakuan et al., 2010; Suradi et al., 2007; Yusuf et al., 2007), TQM methods/processes (Zakuan et al., 2010; Rohani et al., 2006), and supplier information (Zakuan et al., 2010; Narasimhan & Nair, 2005; Hemsworth et al., 2005).

Committed Leadership: As competition increases and changes occur in the business world, there is the need to have a better understanding of quality. To implement TQM successfully, top management must first believe in it. They also have to demonstrate it by commitment (Brown, Hitchcock, & Willard, 1994). Garvin (1986) reported in his article that high product quality did not exist without strong top management commitment. TQM requires the cooperation of top managers in all departments and divisions of an organization, and across functions, if it is to succeed. **Adoption and Communication of TQM:** Communication is one of most important elements in the success of every organization and managers in organizations spend a large number of their time daily communicating. For employees to understand and embrace any change process, managers must communicate to them. The introduction of TQM in an organization involves change and employees have to be communicated to, to understand it and be part of it since TQM requires total employee involvement. The leadership in the organization must ensure that they have communicated the principles and strategies and also the advantages of TQM to the general employees.

Closer Customer Relationship: The customer today dictates the market. The primary focus of TQM is the customer. It is aimed at satisfying customer needs. Demirbag, Tatoglu, Tekinkus, and Zaim (2006) have indicated that customer satisfaction is increased by the participation of all employees in TQM. A successful organization recognizes the need to put the customer first in every decision made. In product design and during the development process, the customer should be closely involved and should provide inputs at every stage of the process, so as to avoid waste, defects and quality problems (Flynn, Schroeder, & Sakakibaba, 1994). It has also been concluded by Ugboro and Obeng (2000) that TQM is an approach used in directing organizational efforts toward the goal of customer satisfaction. Consumers demand high quality levels of products or services at reasonable prices to achieve value and customer satisfaction.

Closer Supplier Relationship: The supplier quality management is an important element of quality management because the materials supplied are normally a major source of quality issues (Flynn et al., 1994). Juran and Gryna (1993) wrote that the poor quality of suppler items resulted in extra costs for a purchaser. For manufacturers to produce quality products, they need quality supplies from the supplier. Therefore there should be a close relationship between the manufacturer and supplier. The supplier must understand what the manufacturer needs to be able to supply at the right time.

Increased Training: Education and training forms a vital part of TQM. For employees to understand the principles of TQM, every organization will need to train their employees. Quality education and training include quality awareness education and basic quality management methods, such as statistical process control, problem-solving methods, basic tools and techniques which become a failure if they do not result in a change in behavior (Juran & Gryna, 1993). The successful implementation of TQM and the potential benefits to be obtained will depend on several factors that may include human resources (Yang, 2006)**,** therefore, they have to be trained.

Employee Empowerment: The employees in an organization may acquire new knowledge and skills by participating in TQM. As they participate, it leads to lasting changes in behavior which results in quality improvement (Juran & Gryna, 1993). Some of the advantages of participation are that, it can change some employees' negative attitudes, reduce conflict stemming from the working environment, instill in them a better understanding of the importance of product quality and contribute to the establishment of an organization-wide quality culture. TQM will do little to improve the performance of an organization unless all employees embrace it, and this often requires a change in an organization's culture.

Process Improvement: To avoid breakdowns, a key part of any total quality strategy is the management of the processes which is focused on managing the manufacturing process so that it operates as expected. Process management involves precisely defining and documenting process management procedures with instructions for machine operation and set-up posted at each workstation to minimize the likelihood of operator error. The methods which are used for process control and improvement are problem solving methods, statistical process control, failure mode effects analysis, fool proofing, sampling and inspection (Flynn et al., 1994).

Methodology

The study was conducted in manufacturing companies in Kumasi, the second largest city in Ghana. Simple random sampling technique was adopted by the researchers in getting the respondents to answer the questionnaires. Before administering the full survey, a pilot study (3 weeks) was conducted in 20 manufacturing companies. With the pilot study 20 copies of the questionnaires were pre-tested, using some selected manufacturing companies. After minor editing of the questionnaire, two hundred and fifty (250) questionnaires were sent out using the face to face method for data collection. The questionnaires were administered on managers in nine different manufacturing sectors including the timber and wood, plastics, pharmaceuticals, electrical and electronics, iron and steel, aluminum, textile, food, and furniture. Questions included demographics such as age of firm, number of workers employed, how long organization has used TQM or any quality management tool, foreign owned and/or managed or indigenous owned/managed. The target population was manufacturing companies in Ghana. The subjects for the study were owner/ managers or top and key managers of these firms. One section of the questionnaire was based on the total quality management constructs including; top management commitment, training, customer driven information, process control and improvement, employee empowerment, supplier information, and communication.

Data Processing and Analysis

Out of 250 questionnaires administered, survey questionnaires with missing data and data anomalies were eliminated resulting in a final valid sample of 101. The responses were assigned numeric codes and data entered into a SPSS (version 18.0) file for statistical analyses. Frequency and Chi-Square analyses were conducted to produce tables for each demographic variable and frequency distributions among the subcategories. Reliability tests were conducted to examine the level of bias among the questionnaire responses. For analysis of hypothesis one through seven, correlation and regression analyses were conducted to observe the degree of relationship of the linkage factors affecting TQM impact on organization performance. Analysis of Variance was conducted to observe the differences in the linkage factors affecting TQM impact on organizational performance between the Ghanaian and foreign firms. The test of statistical significance was set for Type-I error at alpha .05.

For the analysis of the hypothesis, a confirmatory factor analysis (CFA) was first performed using SPSS (v18.0) to test how well the forty measured variables of seven organizational linkage factors represent the constructs. The CFA was conducted using Principal Component and Varimax rotated method. Based on the rotated factor correlation loadings, seven factors extracted cumulative percent variance of 76%. Upon examination of the rotated component correlations, five questions out of 40 questions did not fall within its specific construct and were not considered in the proposed structural equation models (SEM) - one question from construct customer driven information, one question from process control and improvement, one from construct employee empowerment, and two questions from construct supplier involvement.

Structural Equation Modeling (SEM) was proposed where the seven organizational linkage factors were related against the five categories of the practices of TQM impact on performance – productivity, market share, sales growth, profit growth, and quality of product/service.

The purpose of the Structural Equation Modeling (SEM) was to observe the combined effect of the seven organizational linkages on the practices of TQM impact on performance (Hair, Black, Babin, & Anderson, 2010). Instead of performing five individual multiple regression which would regress only one dependent variable of performance at a time, by performing SEM, we can observe altogether at the same time the combined effect of seven organizational linkages on the five dependent variables of practices of TQM impact on performance - productivity, market share, sales growth, profit growth, and quality of product/service, thereby determining systematic and statistically significant co-variation between constructs. The latent factors were created based on the combined effect of the seven organizational linkages and the practices of TQM impact on performance. SEM analysis was performed using AMOS version 18.0.

Demographics

Out of a total of 101 usable responses, 52 (51.5%) were Ghanaian owned companies and 49 (48.5%) were foreign owned companies. The Table 1 shows the breakdown of the type of business by company ownership.

Table 1: Type of Business by Company Ownership

Type of Business	Owned by Ghanaian or Foreign		
	Ghanaian Owned	Foreign Owned	Total
Timber / Wood	0	4	4
Plastics	3	2	5
Pharmaceuticals	9	2	11
Electrical/Electronics	2	1	3
Iron/Steel	4	0	4
Aluminum	2	3	5
Textile	5	0	5
Food	11	28	39
Furniture	2	0	2
Others	14	9	23
Total	52	49	101

Majority of the type of businesses was food industry (39%), followed by others (23%) and Pharmaceuticals (11%). 93 (93%) of the companies were in business for 3 years and more. Majority (46%) of the companies had 51 and more employees, followed by 12% for 41-50 employees. Out of 49 Foreign owned companies, 32 companies employed 51 plus employees. 85 (85%) companies have used TQM in their business for 3 years and more. The distribution between the Ghanaian and the foreign owned companies of the number of years using TQM for 3 years and more is reasonably even. Ninety-eight percent of the companies were familiar or very familiar with TQM. This indicates companies in the sample had the opportunity to consider using TQM in enhancing business operations. Except one foreign owned company, all other 100 companies used other quality tools in addition to TQM. This indicates companies in the sample had the opportunity to consider using TQM and other quality tools in enhancing business operations.

Reliability Test

Reliability analysis was performed separately on items of each linkage factor to check the internal consistency of the survey responses. The analysis in Table 2 shows all linkage factors have a Cronbach's alpha value above 0.7, which testifies to the reliability of the survey questionnaire.

Table 2: Reliability of Linkage Factors of TQM and Organizational Survival of Manufacturing Companies in Ghana

Questionnaire Reliability of Linkage Factors of TQM and Organizational Survival of Manufacturing Companies in Ghana		
Organizational Linkage Factors (Survey Sample n = 101)	Cronbach Alpha	No. of Item Questions
Top Management Commitment to TQM	0.927	6
Top Management Commitment to TQM-Productivity, Market Share, Sales Growth, Profit Growth, Quality of Product or Service	0.889	5
Training	0.923	5
Training-Productivity, Market Share, Sales Growth, Profit Growth, Quality of Product or Service	0.916	5
Customer Driven Information	0.887	6
Customer Driven Information-Productivity, Market Share, Sales Growth, Profit Growth, Quality of Product or Service	0.920	5
Process control and improvement	0.902	7
Process control and improvement-Productivity, Market Share, Sales Growth, Profit Growth, Quality of Product or Service	0.879	5
Employee Empowerment	0.915	6
Employee Empowerment-Productivity, Market Share, Sales Growth, Profit Growth, Quality of Product or Service	0.935	5
Supplier Involvement	0.833	6
Supplier Involvement-Productivity, Market Share, Sales Growth, Profit Growth, Quality of Product or Service	0.894	5
Communication	0.894	4
Communication-Productivity, Market Share, Sales Growth, Profit Growth, Quality of Product or Service	0.887	5
IMPACT OF TQM on -Productivity, Market Share, Sales Growth, Profit Growth, Quality of Product or Service	0.943	5

Discussion and Results

Correlation Analysis Testing Hypothesis

The Pearson correlation analysis was conducted to observe the degree of relationships among each of the organizational linkages and between each of the organizational linkages and practices of TQM impact on performance. A set of 1-5 Likert scale questions were asked for each of the seven organizational linkages - top management commitment, training for TQM, customer driven information, process control and improvement, employee empowerment, supplier involvement, and communications; That is "indicate your business present position on TQM", where 1=Strongly Disagree; 2= Disagree; 3=Neither Disagree; 4= Agree; 5=Strongly Agree". For each of the organizational linkages, the summated average score was calculated based on the respondent's scores on the number of questions asked for each corresponding linkage.

Next, a set of 1-5 Likert scale questions were asked for each of the five practices of TQM impact on performance - productivity, market share, sales growth, profit growth, and quality of product/service; "indicate how you think organizational linkages affect the practices of TQM impacts on the performance/survival of your company", where 1=decrease, 2=static, 3=moderately improve, 4=consistently improve and 5=significant gains. The score for the practices of TQM impact on performance was calculated by averaging the respondent's scores (1-5 Likert scale) on TQM impact on productivity, market share, sales growth, profit growth, and quality of product/service.

Table 3 shows positive significant correlation coefficients among each of the organizational linkages *($r = .250$, $p < .05$ to $r = .682$, $p < .001$)* and between organizational linkages and the practices of TQM impact on performance *($r = .418$, $p < .001$ to $r = .731$, $p < .001$)*. There is a high degree of co-linearity among TQM variables. For each of these organizational linkages, there is a high degree of relationships with the practices of TQM impact on performance and TQM impact on goods made in Ghana.

Table 3: Pearson Correlations between Organizational Linkages and Practices of TQM Impact on Performance

Pearson Correlation Coefficients (sample size n = 101) Organizational Linkages and Practices of TQM Impact on Performance								
Organizational Linkages	Training (TQM) - Linkage	Customer driven information - Linkage	Process control and improvement - Linkage	Employee empowerment - Linkage	Supplier involvement - Linkage	Communications - Linkage	Practices of TQM impact on performance	TQM Impact on made in Ghana goods
Top management commitment	.639***	.627***	.454***	.468***	.510***	.250*	.418***	.332**
Training (TQM)	1	.747***	.680***	.591***	.606***	.370***	.710***	.464***
Customer driven information		1	.594***	.620***	.682***	.390***	.665***	.389***
Process control and improvement			1	.503***	.597***	.379***	.677***	.227*
Employee empowerment				1	.661***	.651***	.556***	.478***
Supplier involvement					1	.539***	.731***	.301**
Communications						1	.513***	.271**
Practices of TQM Impact on Performance							1	.378***

p * <.05, ** < .01, *** < .001

Summary of Correlation Analysis

There is a positive significant relationship *(r = .418, p = .000)* of top management commitment, responsibility, participation, and provision of resources linked to practices of TQM impacting organization performance.

There is a positive significant relationship *(r = .710, p = .000)* of employee training, providing resources, support to work systems, and management commitment linked to practices of TQM impacting organization performance.

There is a positive significant relationship *(r = .665, p = .000)* of measure of internal and external customers' needs, focus on customer requirements and complaint resolutions linked to practices of TQM impacting organization performance.

There is a positive significant relationship *(r = .677, p = .000)* of process capability, workshop, facilities, equipment layout, equipment maintenance, and implementation of quality inspections linked to practices of TQM impacting organization performance.

There is a positive significant relationship *(r = .556, p = .000)* of employee involvement, employee satisfaction, employee recognition, and employee using QC tools for process control and improvement linked to practices of TQM impacting organization performance.

There is a positive significant relationship *(r = .731, p = .000)* of supplier selection, supplier given clear specifications, maintaining supplier database, supply chain management system, and supply quality audit and evaluation linked to practices of TQM impacting organization performance.

There is a positive significant relationship *(r = .513, p = .000)* of shop-floor workers and management communications, employee access to and face-to-face communications with top management, and employees receiving feedback linked to practices of TQM impacting organization performance.

Structural Equation Model (SEM)

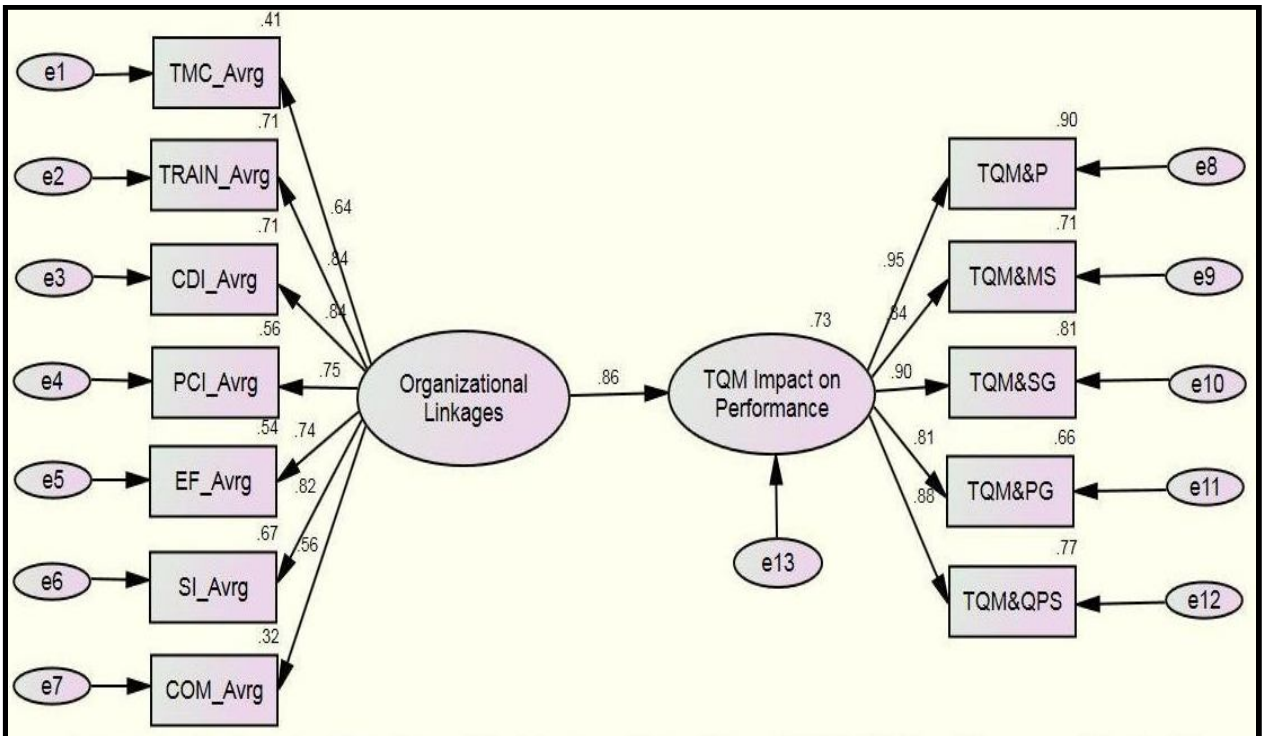
Hypothesis: There is a significant effect of the TQM variables of top management commitment, training for TQM, customer driven information, process control and improvement, employee empowerment, supplier involvement, and communications on the practices of TQM impact on organization performance for productivity, market share, sales growth, profit growth, and quality of product/service.

For hypothesis testing, two structural equation models (SEM) were proposed to observe the relationships between seven organizational linkages and five practices of TQM impact on performance of Ghanaian companies as shown in Figures 1 and 2 below. The seven independent variables of the proposed model included 1) among top management commitment (6 questions), 2) training for TQM (5 questions), 3) customer driven information (6 questions), 4) process control and improvement (7 questions), 5) employee empowerment (6 questions), 6) supplier involvement (6 questions), and 7) communications (4 questions). The five dependent variables included 1) productivity, 2) market share, 3) sales growth, 4) profit growth, and 4) quality of product/service. Before analyzing the proposed SEM models, confirmatory factor analysis (CFA) was performed to corroborate the construct validity and the discriminate validity of the seven organizational linkages. The Principal Component with correlation matrix method was used to extract the seven factors. The Varimax routine was used to rotate the initial factor mix. SPSS software was used to conduct CFA on the seven organizational linkages examining the maximum variance (76%) and assessing the correlations between the variables and the rotated extracted components. Good discriminate validity was observed for 35 out 40 questions showing high loading (correlations varied from .450 to .864) with its own factor and (correlate) low to the other factors. These results indicate good validity of the constructs (Hair, Black, Babin, & Anderson, 2010).

AMOS software was used to conduct analysis for Structural Equation Modeling (SEM) to examine the strength of the relationships between the model independent and dependent variables. We used confirmatory modeling approach to examine the relationships. The building of the SEM model was based on literature review documenting the seven organizational linkages related to the five practices of TQM impact on performance. The structural equation modeling provided outcomes that assessed how well the model fitted the empirically collected data.

Two SEM models were developed and tested. Figure 1 shows the first SEM model that included the summated average scores of the seven organizational linkages with the summated average scores of the five practices of TQM impact on performance. Figure 2 shows the second SEM model that included the raw scores (Likert scale) of the seven organizational linkages with the summated average scores of the five practices of TQM impact on performance. The first SEM model summated average scores of the seven organizational linkages model (Figure 1) was developed because it would give smaller number of degrees of freedom, lower residual errors, and better fit parameters as compared to the second model (Figure 2) using raw scores (Likert scale) of the seven organizational linkages. Although the multiple R-squared values of the two SEM models were similar *(Figure 1, R-squared = .73 and Figure 2, R-squared = .77),* overall the model goodness-of-fit parameters were better for the first model (Figure 1) than for the second model (Figure 2), therefore this paper will present the results of the summated average scores SEM model shown in Figure 1.

Figure 1: Structural Equation Modeling of Organizational Linkages and Practices of TQM Impact on Performance of Ghanaian Companies – Summated Average Scores of Organizational Linkages

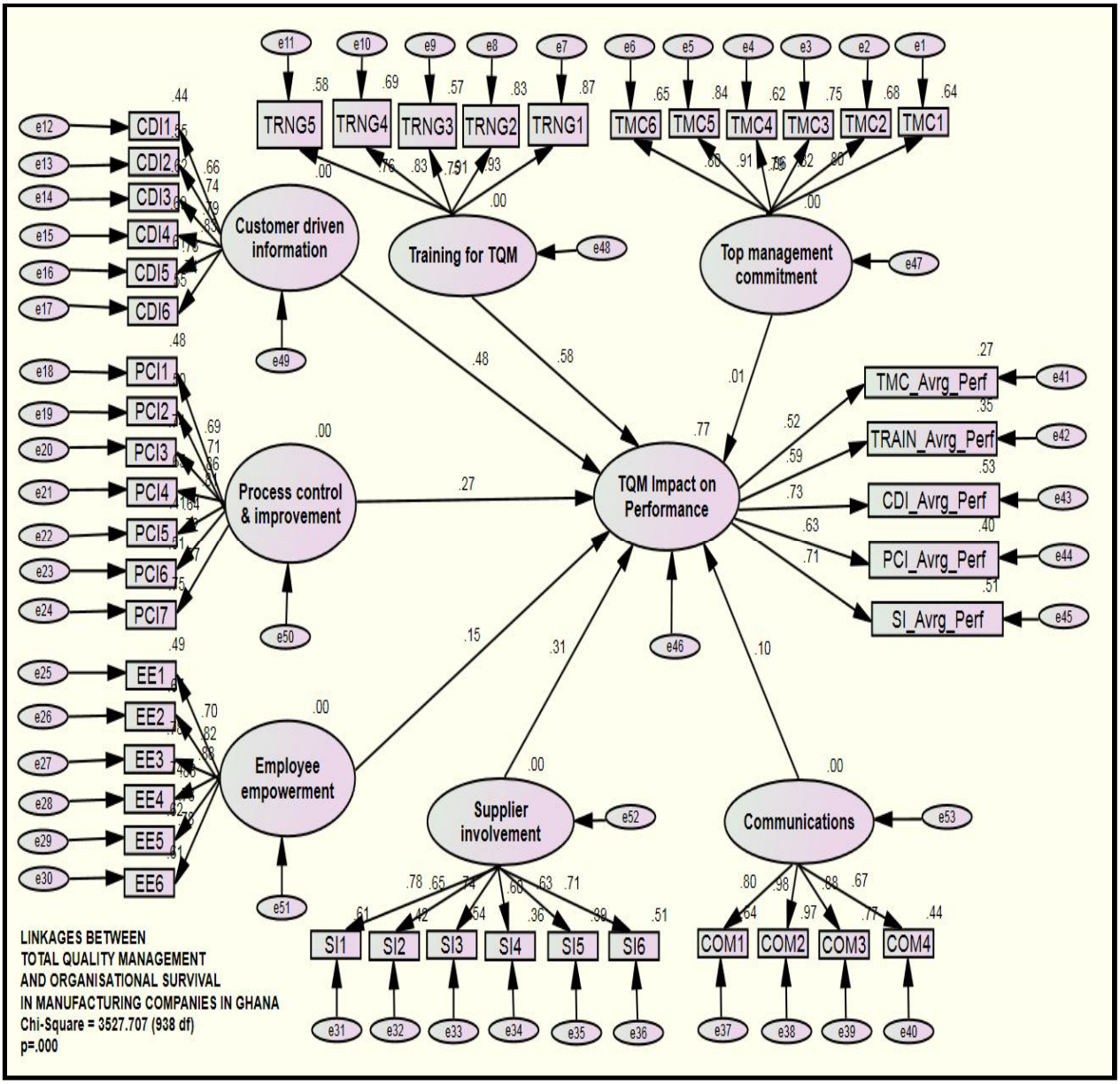


LINKAGES BETWEEN TOTAL QUALITY MANAGEMENT AND ORGANISATIONAL SURVIVAL IN MANUFACTURING COMPANIES IN GHANA
Chi-Square = 174.090 (53 df)
p=.000

Variable Information

Variable	Position	Label
TQM_Productivity	1	TQM&P_ Impact on Productivity
TQM_MS	2	TQM&MS_Impact on Market Share
TQM_SG	3	TQM&SG_Impact on Sales growth
TQM_PG	4	TQM&PG_Impact on Profit Growth
TQM_QPS	5	TQM&QPS_Impact on Quality of Product or Service
TMC_Avrg	6	TMC_Avrg Top management commitment - Linkage
TRAIN_Avrg	7	TRAIN_Avrg Training (TQM) - Linkage
CDI_Avrg	8	CDI_Avrg Customer driven information - Linkage
PCI_Avrg	9	PCI_Avrg Process control and improvement - Linkage
EF_Avrg	10	EF_Avrg Employee empowerment - Linkage
SI_Avrg	11	SI_Avrg Supplier involvement - Linkage
COM_Avrg	12	COM_Avrg Communications - linkage

Figure 2: Structural Equation Modeling of Organizational Linkages and Practices of TQM Impact on Performance of Ghanaian Companies - Raw Scores of Organizational Linkages



The results of the SEM model (Figure 1) fit summary is shown in Table 4. The model is minimized, giving goodness-of-fit (GOF) of overall model *Chi-Square = 174, p = .000, df = 53*. The *p*-value (.000) is significant using a Type I error rate of .05. Though the GOF statistics does not indicate that the observed covariance matrix matches the estimated covariance matrix within the sampling variance, the normed Chi-Square value is 3.28 (Chi-Square divided by degrees of freedom). A number smaller than 2.0 is considered very good, and between 2.0 and 5.0 is acceptable. Thus, the normed Chi-Square of 3.28 suggests an acceptable fit for the CFA model. Other fit statistics considered for assessing GOF are root mean square error of approximation *(RMSEA = .151 with .127 at lower 90% confidence and .176 at upper 90% confidence)*, goodness-of-fit index *(GFI = .795)*, normal fit index *(NFI = .843)*, comparative fit index *(CFI = .884)*, relative fit index *(RFI = .804)*, adjusted goodness-of-fit index *(AGFI = .698)*, and parsimony normed fit index *(PNFI = .677)*.

For SEM analysis, in general no absolute value for the various fit indices suggests a good fit, only guidelines are available for model assessment. The GOF indices listed above are comparable to the rule of thumb values generally acceptable for SEM model fit (Hair, Black, Babin, & Anderson, 2010, p654, p698).

The assessment values associated with acceptable models vary from situation to situation and depend considerably on the sample size, number of measured variables, and the communalities of the factors (Hair, Black, Babin, & Anderson, 2010). Future research may investigate such a model or consider similar parameters with larger sample size examining more complex relationships between organizational linkages and practices of TQM impact on organization performance.

Table 4: Model Fit Summary of Structural Equation Modeling of Organizational Linkages and Practices of TQM Impact on Performance of Ghanaian Companies

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	25	174.090	53	.000	3.285
Saturated model	78	.000	0		
Independence model	12	1107.792	66	.000	16.785

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	1.741	1.211	.849	1.649
Saturated model	.000	.000	.000	.000
Independence model	11.078	10.418	9.376	11.534

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.048	.795	.698	.540
Saturated model	.000	1.000		
Independence model	.390	.202	.057	.171

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.151	.127	.176	.000
Independence model	.397	.377	.418	.000

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.843	.804	.885	.855	.884
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	224.090	231.562	289.468	314.468
Saturated model	156.000	179.310	359.979	437.979
Independence model	1131.792	1135.379	1163.174	1175.174

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.803	.677	.710
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	2.241	1.879	2.679	2.316
Saturated model	1.560	1.560	1.560	1.793
Independence model	11.318	10.276	12.434	11.354

NCP

Model	NCP	LO 90	HI 90
Default model	121.090	84.867	164.922
Saturated model	.000	.000	.000
Independence model	1041.792	937.606	1153.387

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	41	46
Independence model	8	9

Table 5 and Table 6 show various coefficients of the model. The coefficient of determination value multiple R squared is 0.733 *(R = 0.856, p = .000),* and the standardized regression coefficient between the seven organizational linkages and the five practices of TQM impact on performance is 0.856. The model shows that productivity *(standardized regression coefficient β = .95)* and sales growth *(β =.90)* are affected most by the organizational linkages followed by Quality *(β =.88),* Market Share *(β =.84),* and Profit growth *(β =.81)*. These values are all significant indicating strong positive relationships between organizational linkages and the practices of TQM impact on organization performance of companies in Ghana.

Table 5: Coefficients of Regression of Structural Equation Modeling of Organizational Linkages and Practices of TQM Impact on Performance of Ghanaian Companies

Estimates (Group number 1 - Default model)

Scalar Estimates (Group number 1 - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
TQM Impact on_Performance	<---	Organizational_Linkages	1.668	.241	6.924	***	par_11
TMC_Avrg	<---	Organizational_Linkages	1.000				
TRAIN_Avrg	<---	Organizational_Linkages	1.453	.206	7.053	***	par_1
CDI_Avrg	<---	Organizational_Linkages	1.252	.177	7.055	***	par_2
PCI_Avrg	<---	Organizational_Linkages	.979	.151	6.465	***	par_3
EF_Avrg	<---	Organizational_Linkages	1.311	.206	6.365	***	par_4
SI_Avrg	<---	Organizational_Linkages	1.054	.152	6.932	***	par_5
COM_Avrg	<---	Organizational_Linkages	1.167	.230	5.066	***	par_6
TQM_Productivity	<---	TQM Impact on_Performance	1.000				
TQM_MS	<---	TQM Impact on_Performance	.769	.057	13.452	***	par_7
TQM_SG	<---	TQM Impact on_Performance	.941	.058	16.219	***	par_8
TQM_PG	<---	TQM Impact on_Performance	.706	.058	12.261	***	par_9
TQM_QPS	<---	TQM Impact on_Performance	.791	.052	15.165	***	par_10

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
TQM Impact on_Performance	<---	Organizational_Linkages	.856
TMC_Avrg	<---	Organizational_Linkages	.643
TRAIN_Avrg	<---	Organizational_Linkages	.840
CDI_Avrg	<---	Organizational_Linkages	.840
PCI_Avrg	<---	Organizational_Linkages	.750
EF_Avrg	<---	Organizational_Linkages	.736
SI_Avrg	<---	Organizational_Linkages	.821
COM_Avrg	<---	Organizational_Linkages	.561
TQM_Productivity	<---	TQM Impact on_Performance	.951
TQM_MS	<---	TQM Impact on_Performance	.843
TQM_SG	<---	TQM Impact on_Performance	.898
TQM_PG	<---	TQM Impact on_Performance	.812
TQM_QPS	<---	TQM Impact on_Performance	.879

Table 6: Squared Multiple Correlations of Regression of Structural Equation Modeling of Organizational Linkages and Practices of TQM Impact on Performance of Ghanaian Companies

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
TQM Impact on_Performance	.733
TQM_PG	.659
TQM_SG	.806
TQM_QPS	.772
TQM_MS	.710
TQM_Productivity	.904
COM_Avrg	.315
SI_Avrg	.674
EF_Avrg	.542
PCI_Avrg	.563
CDI_Avrg	.706
TRAIN_Avrg	.705
TMC_Avrg	.414

Conclusions and future research

In this study, seven total quality management (TQM) variables including of top management commitment, training for TQM, customer driven information, process control and improvement, employee empowerment, supplier involvement, and communications were utilized to conceptualizing TQM philosophy of management. The study employed the quantitative analysis and presented a positive correlation between the TQM variables (independent) and performance (dependent). This study has revealed that total quality management when implemented and practiced in Ghanaian manufacturing businesses will improve the performance of these businesses and help in the survival of these manufacturing companies. Quality it is said helps a firm gain competitive advantage; therefore the practice of total quality management will help Made in Ghana products gain competitive advantage over foreign products. This study has demonstrated that manufacturing companies in Ghana both foreign managed and Ghanaian managed believe total quality management is a key-contributing factor to firm performance and survival. Though some managers may be familiar with quality management practices and its advantages and therefore would want to implement them, their employees may not know what they are. Communication is very essential in this regard. In the implementation, careful attention must be given to the top management commitment, supplier involvement, and process control and improvement variables. Also the customer driven information variables must not be overlooked, as careful analysis of employee empowerment will direct the firm on its production policy. The results have validated previous studies in which they concluded a positive relationship between TQM practices and company performance. Future research should focus on a cross country analysis of quality management practices and performance in Africa.

Research limitations: Availability and willingness of respondents was a big challenge though efforts were made to assure respondents of confidentiality. Further, this study is limited by the use of self-reported data.

Practical implications/recommendations

The findings of this study have implications for the practice of total quality management in manufacturing organizations and for research. It has also contributed to a better understanding of the field of Total Quality Management. Given that there is much talk about patronage of Made in Ghana products and the concern about the quality of these products, this study has important implications for managers and organizations. It provides a better understanding of the relationships between the various total quality management variables of top management commitment, training for TQM, customer driven information, process control and improvement, employee empowerment, supplier involvement, and communications and organizational survival. Such programs on total quality management must be practically based for better understanding of its implementation.

The findings generated from this study provide empirical support that the implementation and practice of total quality management in manufacturing organizations will assist in the performance and survival of these organizations. Helpful insights as to the usefulness of TQM have also been provided for organizations and managers who have some concerns about TQM. The study has also demonstrated that Ghanaian and foreign owned manufacturing companies believe that total quality management is a key-contributing factor to firm's survival.

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